

WHAT IS CLAIMED IS:

1. A toroidal type continuously variable transmission comprising:

input and output discs coaxially and rotatably arranged about a common axis, the input and output discs having respective toroidal concave surfaces which face each other;

power rollers each having a rounded outer surface and being interposed between the toroidal concave surfaces of the input and output discs;

a loading cam that presses the input disc against the power rollers by a force that is proportional to an input torque;

trunnions each supporting the corresponding power roller in such a manner that the power roller is inclinable relative to a center of curvature of the input and output discs; and

power roller bearings rotatably supporting the power rollers relative to the respective trunnions,

wherein the following inequality is established for a curvature ratio ($Ro/(2 \times R22)$):

$$20 \quad Ro/(2 \times R22) \leq 0.63$$

wherein:

Ro: radius of curvature of the toroidal concave surface of each of the input and output discs, that is defined on a cross section of each of the input and output discs taken along the common axis,

R22: radius of curvature of the rounded outer surface of each power roller, that is defined on a cross section of the power roller taken along the common axis.

30 2. A toroidal type continuously variable transmission as claimed in Claim 1, in which the following inequality is further established:

$$Ro/(2 \times R22) \geq 0.53$$

3. A toroidal type continuously variable transmission as claimed in Claim 1, in which the following inequality for a bearing stress "BS" is further established:

$$BS \leq 4.2 \text{ Gpa}$$

wherein:

BS: stress applied to a contact surface

- 10 between the power roller and each of the input and output discs during operation of the transmission.

4. A toroidal type continuously variable transmission as claimed in Claim 1, in which the following inequality for a bearing stress "BSt" is established:

$$BSt \leq 4.2 \text{ Gpa}$$

wherein:

BSt: stress applied to a contact surface

- 20 between the power roller and each of the input and output discs when a maximum engine torque is applied to the transmission.

5. A toroidal type continuously variable transmission as claimed in Claim 1, in which the following inequality is further established:

$$S \geq 0$$

wherein:

S: spin degree at a contact point between

- 30 the power roller and each of the input and output discs.

6. A toroidal type continuously variable transmission as claimed in Claim 5, in which the spin degree "S" is calculated from the following equation:

5 $S = \omega_s / \omega_i$

wherein:

ω_s : spin angular speed of the power roller,

ω_i : angular speed of the input disc.

10 7. A toroidal type continuously variable transmission as claimed in Claim 6, in which the spin degree "S" is calculated from the following equation.

$S = \{\sin \theta \times \sin \phi - (1 + k - \cos \phi) \times \cos \theta\} / \sin \theta$

15 wherein:

θ : open angle defined between a normal line of a contact point between the power roller and the output disc and a rotation axis of the power roller,

ϕ : inclination angle of the power roller, and

20 k : cavity aspect ratio, that is, ratio of a difference (e) between a distance from the center (O_1) of curvature of the input disc to the common axis (DA) of the input and output discs and the radius of curvature (R_o) relative to the radius of curvature (R_o).

25 8. A toroidal type continuously variable transmission as claimed in Claim 5, in which the inequality " $S \geq 0$ " is kept established throughout a range from a lower speed side to a higher speed side.

30 9. A toroidal type continuously variable transmission as claimed in Claim 1, in which an input member of the loading cam is connected to an engine through a torsion damper.

10. A toroidal type continuously variable transmission as claimed in Claim 1, in which an input member of the loading cam is connected to an engine through a torque converter.